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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,714	05/25/2006	Tadaaki Harada	062568	5487
38834 7590 04/15/2009 WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP 1250 CONNECTICUT AVENUE, NW SUITE 700 WASHINGTON, DC 20036				
EXAMINER				
HON, SOW FUN				
ART UNIT		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/580,714

Applicant(s)

HARADA ET AL.

Examiner

SOPHIE HON

Art Unit

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01/21/09 has been entered.

Response to Amendment

Withdrawn Rejections

2. The 35 U.S.C. 103(a) rejections of claims 1-16 over Shibahara in view of Border as the primary combination of references, are withdrawn due to Applicant's amendment dated 01/21/09.

New Rejections

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-2, 4-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Parent claim 1 recites "wherein the inorganic

particles are contained in a range of 25 to 60 wt. %", but fails to specify whether the wt. % is based on the weight of the sum of the resin and the particles, or the weight of the resin sheet. For the purposes of examination, the claims are treated according to the first interpretation since it appears to be more consistent with Example 1 of Applicant's specification.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-2, 4-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiba (JPO Website Machine English translation of JP 2003-202816) in view of Shibahara (US 7,132,154) and Border (US 2002/0123550 A1).

Regarding claims 1, 17, Shiba teaches a resin sheet for use in a substrate for a display device (plastic plate, [0001]), said resin sheet comprising a cured resin layer (curing resin such as epoxy resin, [0008]) containing in a resin a glass fiber cloth-like material (glass fabric, [0004]) and inorganic filler particles having a mean particle size within a range of 2 micrometers less ([0004]), which contains the claimed mean particle size of 100 nm or smaller, wherein the inorganic filler particles are contained in a range of 9 to 80 wt.% based on the sum of the weight of the resin and the particles (ten to 400 weight section per 100 weight section of resinous principal, [004]), which contains the claimed range of 25 to 60 wt.% or 25 to 50 wt. %. Shiba fails to teach that the resin sheet is structured to have a haze value within a range of 10% or lower.

However, Shiba teaches that transparency is not required only when using the resin sheet as a substrate for a high reflective-type liquid crystal display device ([0005]), which implies that transparency is required when using the resin sheet as a substrate for a high transmission-type liquid crystal display device.

Shibahara teaches a resin sheet for use in a substrate for a display device (plastic sheet substrate, column 10, lines 12-13), comprising a cured resin layer containing in a resin ((a) epoxy resin, column 7, lines 55-60) a glass fiber cloth-like material (glass filler (b), glass cloths most preferred, column 9, lines 1-8) and inorganic particles (composite composition may further contain another inorganic filler, column 6, lines 43-47, which are particles added to a matrix to improve its properties). Shibahara teaches that the resin sheet has excellent transparency (column 2, lines 10-15) wherein the inorganic filler particles do not impair transparency (column 9, lines 45-47).

Border teaches that inorganic filler particles (silica, [0006]) with a mean particle diameter of 40 nm ([0035]), which is within the claimed range of 100 nm or smaller, is used for the purpose of avoiding the scattering of light ([0035]) and hence is used to maintain the desired level of transparency which allows for the haze value to be within the claimed range of 10% or lower.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have structured the resin sheet of Shiba to have a haze value that is within a range of 10% or lower, in order to obtain the desired transparency and hence high level of light transmission for a high transmission-type display device, as taught by Shibahara in light of Border.

Regarding claim 2, Shiba fails to teach that the refractive index between the resin that forms the cured resin layer, and the glass fiber cloth-like material is within a range of 0.01 or less.

However, Shiba teaches that transparency is not required only when using the resin sheet as a substrate for a high reflective-type liquid crystal display device ([0005]), which implies that transparency is required when using the resin sheet as a substrate for a high transmission-type liquid crystal display device.

Shibahara teaches that the refractive index difference between the resin that forms the cured resin layer and the glass fiber cloth-like material is more preferably not more than 0.005 (column 3, lines 20-25), which is within the claimed range of 0.01 or less, for the purpose of providing the desired transparency.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided a refractive index difference between the resin that forms the cured resin layer, and the glass fiber cloth-like material, that is within a range of 0.01 or less, in order to obtain the desired transparency and hence high level of light transmission for a high transmission-type display device, as taught by Shibahara.

Regarding claims 4, 16, Shiba teaches that the inorganic particles are silica particles ([0004]) wherein silica is an inorganic oxide.

Regarding claim 5, Shiba fails to teach that the cured resin layer is an epoxy resin instead of a mixture of epoxy resin and cyanate resin ([0004]).

However, Shibahara teaches that the cured resin layer can be a mixture of epoxy resins (column 4, lines 1-5) for the purpose of matching the refractive index of the glass fiber cloth-like material (filler, column 3, lines 60-65), and still provide a coefficient of linear expansion that is within a range of equal to or less than $2.0 \times 10^{-5}/^{\circ}\text{C}$ at 30 to 150 $^{\circ}\text{C}$ (most preferably not more than 20 ppm, column 10, lines 1-6) which is within the claimed range of equal to or less than $5.0 \times 10^{-5}/^{\circ}\text{C}$ at 25 to 160 $^{\circ}\text{C}$.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used an epoxy resin containing a mixture of epoxy resins in lieu of the mixture of epoxy resin and cyanate resin as the cured resin layer of the resin sheet of Shiba, in order to obtain the desired matching of the refractive index of the glass fiber cloth-like material, and still provide the desired low coefficient of linear expansion, as taught by Shibahara.

Regarding 6, Shiba teaches that the resin sheet has a coefficient of linear expansion that is $5 \times 10^{-6}/^{\circ}\text{C}$ at 50 to 200 $^{\circ}\text{C}$ (abstract) which is within the claimed range of equal to or less than $5.0 \times 10^{-5}/^{\circ}\text{C}$ at 25 to 160 $^{\circ}\text{C}$.

Regarding claim 7, Shiba fails to teach that the light transmittance of the resin sheet is within a range of 88% or more.

However, Shiba teaches that transparency is not required only when using the resin sheet as a substrate for a high reflective-type liquid crystal display device ([0005]), which implies that transparency and hence light transmittance is required when using the resin sheet as a substrate for a high transmission-type liquid crystal display device.

Shibahara teaches that the light transmittance of the resin sheet used as a substrate for a display device can be within a range of 88% or more (columns 13-14, lines 50-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have structured the resin sheet of Shiba to have a light transmittance that is within a range of 88% or more, in order to obtain the desired high level of light transmittance for a high transmission-type liquid crystal display device, as taught by Shibahara.

Regarding claim 8, Shiba teaches that a gas barrier layer is further laminated (coated layer of resin, Barrier-processing of gas permeation-proof nature, [0015]).

Regarding claim 9, Shiba teaches that a hard-coat layer is further laminated (coated layer of resin, hard coat processing, [0015]).

Regarding claims 10-11, Shiba teaches a liquid crystal display device that comprises a liquid crystal cell substrate that comprises the resin sheet discussed above (liquid crystal display element, [0001]).

Regarding claims 12-13, Shiba teaches an electroluminescence display device that comprises a substrate that comprises the resin sheet discussed above ([0001]).

Regarding claim 14, Shiba teaches that substrates for displays can comprise the resin sheet as discussed above. Shiba fails to teach that a substrate for a solar cell can also comprise the resin sheet.

However, Shibahara teaches that a substrate for display can also be used as a substrate for a solar cell (solar cell substrates, column 15, lines 25-35) for the purpose of utilizing the same physical properties.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the substrate of Shiba as a substrate for a solar cell, in order to utilize the same physical properties, as taught by Shibahara.

Regarding claim 15, Border teaches that inorganic filler particles (silica, [0006]) with a mean particle diameter of 40 nm ([0035]), which is within the claimed range of 70 nm or smaller, is used for the purpose of avoiding the scattering of light and hence to maintain the desired high level of transparency.

Response to Arguments

5. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample, can be reached on (571)272-1376. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Sophie Hon/

Sow-Fun Hon

Examiner, Art Unit 1794